Sharp EL-506A instruction manual

Liaodian VerA

1 person upvoted with this article

赞同 1
分享

If you don't know how to use Sharp's single-line display calculator at all, then it will be very tiring to read this translation, it is recommended to first get started with the Chinese manual of kk-105, ADG98152 and other imitation models (506 can not be found on the Internet Chinese manual, you can only get started through the manual of the imitation. In addition, the 506P is also much easier to buy than the 506a), and then you will use Sharp's one-line machine.

The difference between 506A and 506P has already been discussed, and this manual can provide a more detailed description. The source of the manual is shown in the website logo interspersed in the figure.

If this file is helpful to YOU please donate to paypal.me/RWhitten35

It took me 3 "Freaking Days" to find the "dang thing"! What ever you would like to donate will be fine!

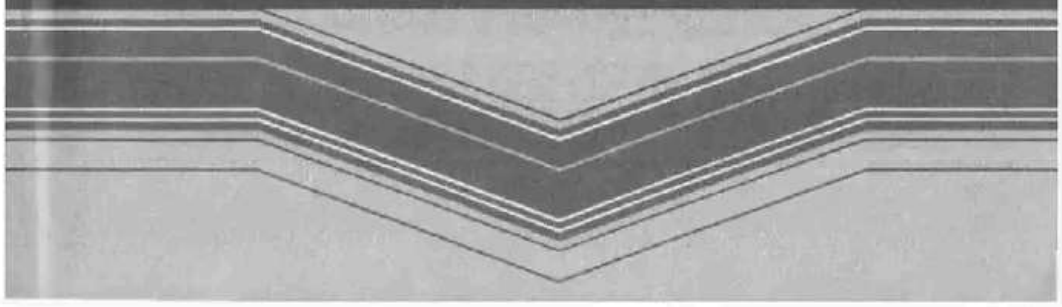
知乎 首发于 计算器爱好者之家

SHARP®

SCIENTIFIC CALCULATOR

MODEL **EL-506A**

OPERATION MANUAL



AD Download to read ad-free.

(ELECTRONIC CALCULATOR)
LIMITED WARRANTY:

SHARP ELECTRONICS CORPORATION warrants this product to the original purchaser to be free from defective materials and workmanship. Under this warranty the product will be repaired or replaced, at our option, without charge for parts or labor, with the exception of batteries, when returned to a SHARP CONSUMER FACTORY SERVICE CENTER listed in the instruction booklet supplied with your unit.

This warranty does not apply to any appearance items nor to any product whose exterior has been damaged or defaced, nor to any product subjected to misuse, abnormal service or handling, nor to any products altered or repaired by other than a SHARP CONSUMER FACTORY SERVICE CENTER. This warranty does not apply to any product purchased outside the United States, its territories, or possessions.

The period of this warranty covers one (1) year on parts and one (1) year on labor including the solar cell from date of purchase.

This warranty entitles the original purchaser to have the warranted parts and labor rendered at no cost for the period of the warranty described above when the unit is carried or shipped, prepaid, to a SHARP CONSUMER FACTORY SERVICE CENTER together with proof of purchase.

THIS SHALL BE THE EXCLUSIVE WRITTEN WARRANTY OF THE ORIGINAL PURCHASER AND NEITHER THIS WARRANTY NOR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, SHALL EXTEND BEYOND THE PERIOD OF THE TIME LISTED ABOVE. IN NO EVENT SHALL SHARP BE LIABLE FOR CONSEQUENTIAL ECONOMIC DAMAGE OR CONSEQUENTIAL DAMAGE TO PROPERTY. SOME STATES DO NOT ALLOW A LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS OR AN EXCLUSION OF CONSEQUENTIAL DAMAGE, SO THE ABOVE LIMITATION AND EXCLUSION MAY NOT APPLY TO YOU. IN ADDITION, THIS WARRANTY GIVES SPECIFIC LEGAL RIGHTS, AND YOU MAY HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

AD Download to read ad-free.

CONTENTS

	Page
INTRODUCTION	4
OPERATIONAL NOTES	5
FEATURES	7
NORMAL CALCULATIONS	10
1. Addition, Subtraction	11
2. Multiplication, Division	13
3. Use of Parentheses	14
Priority Levels in Calculation	16
4. Memory Calculations	20
SCIENTIFIC CALCULATIONS	23
1. Second Function	23
2. Display System and Decimal Places	24

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

3. Modify Function 29
4. Trigonometric Functions 31
5. Inverse Trigonometric Functions 32
6. Hyperbolic and Inverse Hyperbolic Functions 32
7. Squaring and Power 33
8. Square Root, Cubit Root, and Radical Root 33
9. Logarithmic Functions 34
10. Exponential Functions 34
11. Reciprocals 35
12. Factorial 35
13. Permutations and Combinations 35
14. Percent Calculations 36
15. Random Number Generation 36
16. Conversion of Angle and Time Calculations 37
17. Conversion of Coordinates 39

AD Download to read ad free.

COMPLEX NUMBER CALCULATION 43
BINARY, OCTAL, AND HEXADECIMAL NUMBER CALCULATIONS 47
LOGICAL OPERATIONS 54
STATISTICAL CALCULATIONS 55
3-VLE CALCULATION 69
ERRORS 78
CALCULATION RANGE 80
OPERATING CONTROLS 90
DISPLAY 106
BATTERY REPLACEMENT 111
SPECIFICATIONS 114
SCIENTIFIC & CALCULATOR FUNCTIONS 116

AD Download to read ad free.

INTRODUCTION

Thank you for purchasing the SHARP Scientific Calculator Model EL-506A.

This manual will introduce you to the Model EL-506A.
The contents of this manual consist of basic and advanced materials. Sections containing advanced material are labeled "supplementary." You may skip the supplementary sections without hampering your ability to operate the calculator and return to them later as you develop skill in operating the calculator.

Please keep this manual for future reference.

知乎 首发于 计算器爱好者之家

SCRIBD
Trusted by over 1 million members
Try Scribd FREE for 30 days to access over 125 million titles without ads or interruptions!
Start Free Trial
Cancel Anytime.

OPERATIONAL NOTES

Because the liquid crystal display (LCD) of the EL-506A is made of a liquid crystal hermetically sealed between two glass plates, adequate caution must be exercised in handling the calculator.

To ensure trouble-free operation of the calculator, please observe the following points.

1. Do not carry the calculator in the back pocket of slacks or trousers.
2. Do not place the calculator in a location subject to direct sunlight, especially in a car with its window closed in a hot climate. The calculator may be damaged due to high temperatures.
3. Do not place the calculator in a location exposed to high temperatures (e.g., near a heater). Also avoid locations subject to rapid temperature changes and excessive moisture or dust.
4. Do not drop or bump the calculator.
5. Do not use a cloth moistened with any volatile solvent or water to clean the calculator. Always use a soft, dry cloth.

AD Download to read ad-free.

6. Do not leave the batteries in the calculator if the unit is not to be used for an extended period. Otherwise, the calculator may be damaged by battery acid leakage.

If service should be required on this unit, use only a SHARP servicing dealer, SHARP approved service facility, or SHARP repair service where available.

AD Download to read ad-free.

FEATURES

1. Scient
   - Direc
   Form

知乎 首发于 计算器爱好者之家

[×] [5] [y^x] [3] [=]

15 levels of parentheses and 4 levels of pending operations are allowed for solving more complicated formulas.

- **Binary, Octal, and Hexadecimal Calculations**
  Binary, octal, and hexadecimal numbers are mainly used in computer programming. Computer engineers and programmers have frequent needs for converting and calculating binary, octal, and hexadecimal numbers. The calculator now satisfies these needs. Simply enter numbers with base 2, 8, or 16 and the calculator will give you the answer instantly.

AD Download to read ad-free.

- **Logical Operations**
  The EL-506A can also perform logical NOT, AND, OR, XOR, and XNOR operations on binary, octal, and hexadecimal numbers.
- **Complex Number Calculations**
  The EL-506A allows you to calculate complex numbers which are often used for electrical and mathematical calculations. When combined with the coordinates conversion feature, the complex number calculation feature lets you calculate the absolute values of complex numbers or solve for arguments and vector composition.
- **Preprogrammed for 112 Functions**
  The EL-506A comes with a wide variety of preprogrammed functions including trigonometric, inverse trigonometric, logarithmic, hyperbolic, inverse hyperbolic, statistical, and random number generation functions.

AD Download to read ad-free.

2. Useful Keys for Solution of Math Problems

- Keys for single-variable statistical calculation
  Statistical mode setting ([STAT])
  Number of samples and sum total of samples ([n] [Σx])
  Mean value and sum of squares of samples ([x̄] [Σx²])
  Standard deviation ([s] [σ])
  Data input and correction ([DATA] [CD])
- Keys for probability calculations with random variable in normal distribution ([t] [P(t)] [Q(t)] [R(t)])
- Keys for access to two memories ([x→M] [RM] [M+] [x→M₂] [RM₂] [M₂+])
- DEG/RAD/GRAD selector key ([DRG])
- Angular unit conversion key ([DRG▶])
- Degrees/Minutes/Seconds ↔ Decimal degrees conversion key for conversion of an angle between the decimal and sexagenary notation system ([°'"] [→°'"])
- Special mode key useful only for simultaneous linear equations with three unknowns ([SIMLE])
- Display mode designation key for fixed decimal point system, scientific notation, and engineering notations ([FSE])

AD Download to read ad-free.

知乎 首发于 计算器爱好者之家

calculation is performed for about 13 minutes after the calculator has been powered, the calculator will automatically turn the power off saving the battery. To resume operation, press the ON/C key. With the EL-506A, you can designate the desired number of decimal places for an answer in your calculation. To set the Floating Decimal Point System for calculations in this chapter, press the FSE key until FIX, SCI, or ENG indicator disappears.

CLEARING CE →

An incorrectly entered number can be corrected as long as the number has not already been set in register by any following "Function key." Pressing the CE (Clear Entry) key will clear the last entry while retaining all the previous entries in the calculator.

AD Download to read ad-free.

For example:
Key in: 5 × 4 (The entry 4 should have been 6.)
Key in: CE 6 = Answer: 30

If the ON/C key is pressed, all entries in the calculator except those in memory and statistics will be cleared. To correct part of an entered number from its last digit, use the → (Right Shift) key.
Key in: 123 + 12345687 (The last two digits 87 should have been 78.)
Key in: → → 78 = Answer: 12345801

FOUR BASIC FUNCTIONS AND EQUALS KEY + − × ÷ =

1. Addition, Subtraction
Key in: 123 + 456 + 789 = Answer: 1368
100 − 25 − 35 = Answer: 40
Pressing the = key gives the answer to the entered formula.

Using a constant
The calculator incorporates a constant calculation feature by which repeat calculations can be performed using the same number without the need for re-enter-

AD Download to read ad-free.

ing that number followed by the function key.
Key in: 10 + 20 = Answer: 30
20 is now a constant for subsequent addition operations:
Key in: 60 = Answer: 80

Some calculations require a slightly longer time than normal depending on the contents of the formula. If nothing appears on the display during the calculation, do not make any further entries.

To use the sum of numbers as a constant, use (and) keys.
Key in: 10 + (20 + 5) = Answer: 35
4 = 29
Key in: 100 − 25 = Answer: 75
40 = 15
50 − (10 − 2) = 42
20 = 12

AD

知乎 首发于 计算器爱好者之家

NOTE: To enter a negative number, press the [+/-] (Change Sign) key after numeric entry.

Example: 5 + 2×3 − 2 ÷ 0.5
Key in: 5 [+] 2 [×] 3 [−] 2 [÷] .5 [=] Answer: 7
(Press [÷])

NOTE: Multiplication and division have precedence over addition and subtraction. In other words, multiplication and division will be performed before addition and subtraction.

Constant for Multiplication: The number entered before the multiplication sign serves as a constant multiplicand.
Key in: 3 [×] 5 [=] Answer: 15
10 [=] 30
Constant for Division: The number entered after the division sign serves as a

AD Download to read ad-free.

constant divisor.
Key in: 15 [÷] 3 [=] Answer: 5
30 [=] 10

NOTE: Some calculations are retained in the calculator depending on their priority. In successive calculations, therefore, the operator of the last calculation and the last numerical value are handled as a calculation command and as a constant for any calculation (except multiplication), respectively.

a + b × c = +bc (Constant for addition)
a × b ÷ c = ÷c (Constant for division)
a × b − c = −c (Constant for subtraction)

In multiplication using a constant, the first numerical value is handled as a constant.

a ÷ b × c = a/b × (Constant for multiplication)

3. Use of Parentheses

The parentheses keys are needed to cluster together a series of operations if it is necessary to override the priority system of algebra. When open parentheses

SCRIBD
Issued by over 1 million members
Try Scribd FREE for 30 days to access over 125 million titles without ads or interruptions!
Start Free Trial
Cancel Anytime.

are in use on the calculator, the indicator "( )" will appear in the display. This indicator will disappear when the parentheses are closed.
Calculations in parentheses take precedence over any other calculations. Open parentheses can be used up to 15 consecutive times. Calculations within the innermost set of parentheses will be performed first.

Example: 12 + 42 ÷ (8 − 6)
Key in: 12 [+] 42 [÷] [(] 8 [−] 6 [)] [=] Answer: 33
Example: 126 ÷ [(3 + 4) × (3 − 1)]
Key in: 126 [÷] [(] [(] 3 [+] 4 [)] [×] [(] 3 [−] 1 [)] [)] [=]

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

Supplementary 1–Priority Levels in Calculation

The EL-506A is provided with a function that judges the priority levels of individual calculations. Normally, the calculator permits you to perform the key operation of a given algebraic formula as written.

Level	Operation
1	Functions such as sin, x^2, −BIN, NOT, and %
2	y^x, $\sqrt[x]{y}$, nPr, nCr
3	×, ÷
4	+, −
5	AND
6	OR, XOR, XNOR
7	=, M_1+ (M_2+), DATA, CD

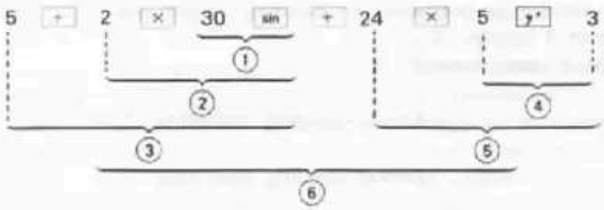
Calculations given the same priority are executed in their sequence in the equation.

Parenthesized calculations have precedence over any other calculations.

AD Download to read ad free.

Example: Order of calculations in 5 + 2 × sin 30 + 24 × 5^3 = 3006

Set the angular unit to "DEG" by pressing the key.



The numbers ① through ⑥ indicate the sequence in which individual calculations are to be carried out. When the calculator performs calculations according to the established priority levels or performs a parenthesized calculation before any other calculation, the units must suspend or set aside the calculation commands and numbers (or values) that cannot be processed immediately. For this reason, the calculator is provided with a memory area for up to four pending operations. Note that an error condition occurs if this memory capacity is exceeded by these pending operations.

AD Download to read ad free.

- Open parenthesis (key can be used up to 15 consecutive times.
- All functions except y^x and $\sqrt[x]{y}$ will be calculated immediately after the key operation without being suspended.
- In calculations without parentheses, no pending operations will occur beyond 3 levels.

(Calculations without parentheses)

Example:

1 + 2 1-level pending operation

① ①

1 + 2

① ①

知乎 首发于 计算器爱好者之家

calculations of "y^x" with the highest priority and "x" equivalent to y^x in priority level are executed. After the [÷] key has been pressed, two pending operations (1+ and 162 ÷) still exist.

AD Download to read ad-free.

(Parenthesized calculations)
Example:

i) 1 [+] 2 [×] 3 [y^x] [(] 4 [÷] 5

ii) 1 [+] 2 [×] [(] 3 [−] 4 [÷] 5 [)]

Four numeric values and four calculation commands are pending.
Pressing the [)] key causes the calculations of 3−4 ÷ 5 in parentheses to be executed, leaving the first two calculations in pending status.

- Parentheses can be used until the number of pending calculations exceeds 4. However, open parentheses can be used up to 15 consecutive times.

Example: Open parentheses used consecutively.
1 × (((2 − 3 × (((4 + 5) × 6) − 7 .....

End of Supplementary 1

AD Download to read ad-free.

4. Memory calculations

The EL-506A has two independently accessible memories, M1 and M2. Data movement in and out of these memories is carried out by the following keys:

[x→M1], [2nd F] [x→M2] : Stores the result of a calculation in memory.
[RM1], [2nd F] [RM2] : Recalls the memory contents.
[M1+], [2nd F] [M2+] : Adds the result of a calculation to the memory contents.

NOTES: [x→M2], [RM2], and [M2+] are the second functions of [x→M1], [RM1], and [M1+], respectively. The [2nd F] key must therefore be pressed before the [x→M2], [RM2], and [M2+] keys, respectively.
Before starting a calculation, clear the contents of either memory by pressing [ON/C] and [x→M1] or [2nd F] [x→M2] keys.

NOTES: (1) Memory calculations cannot be performed in the STAT (statistical calculation), CPLX (complex number) and 3-VLE (3-variable linear equations) modes.
(2) When subtracting a number (the result of a calculation) from either memory, press the [+/−] and [M1+] or [2nd F] [M2+] keys.

AD Download to read ad-free.

(3) Memory M2 is used for calculations in 3-VLE mode. For this reason, the contents of M2 are automatically cleared when the calculator is put in 3-VLE mode.

Key in: 12 [+] 5 [=] [M1+]

Answer: 17 (Adds the result of addition to M1.)

2 [

[RM]

知乎 首发于 计算器爱好者之家

2nd F RM↓

RM↓ + 2nd F RM↓ −

4 (Adds the result of division to M2.)
28 (Recalls the contents of M2.)
38 (Adds the contents of M1 to the contents of M2.)

AD Download to read ad-free.

"MEMORY SAFEGUARD" function

The contents of the memory are retained even when the calculator is powered off. Data stored in memory will thus remain the same until it is changed or until the batteries are exhausted.

AD Download to read ad-free.

SCIENTIFIC CALCULATIONS

Press the FSE key until the FIX, SCI, or ENG indicator disappears to perform calculations in the floating decimal point system. (See "Decimal Places" on page 27 for details.)

1. Second Function

The EL-506A has many preprogrammed functions, however, use of individual keys for all these functions is impossible because of the limited size of the keyboard. Of the 43 keys located on the keyboard, 32 keys have two or more functions. The first function of a key is indicated on the key itself and the second function of that key is printed in brown above or on the right of the key.

The yellow key at the top left of the calculator keyboard is marked "2ndF". This key must be used to designate the second function of a specific key.

Examples:

(1) 1/x ← Second function "1/x" : Press the 2nd F key and then 1/x .
x^2 ← First function "x^2": Press the x^2 key alone.

AD Download to read ad-free.

(2) e^x E ← First function "E" Hexadecimal number: Press the ln key in the HEX (hexadecimal) mode. (To set the hexadecimal mode, press the 2nd F and •HEX keys and the "▬" indicator will
ln

知乎 首发于 计算器爱好者之家

part of the display. If you press this key in error, press it a second time and the "2ndF" designation will disappear.

In this manual, key functions will be shown as follows:

[ON/C] → [2nd F] [nPr] [ON/C] → [nCr]

2. Display System and Decimal Places

The EL-506A has four different display systems which can be selected with the [FSE] (display mode control) key.

SCRIBD
Trusted by over 1 million members
Try Scribd FREE for 30 days to access over 125 million titles without ads or interruptions!
Start Free Trial
Cancel Anytime.

When you press the [FSE] key in the normal calculation mode, the mode symbol "FIX", "SCI", "ENG", or a blank (nothing) will appear at the upper part of the diplay. The [FSE] key is operative after the result of a calculation has been displayed or when the calculator is cleared with [ON/C] key.
The designated decimal point system and decimal places will be retained even when the calculator is powered off.

(1) FIX (FIXed decimal point system)

- Each calculation result is displayed after being rounded to the number of decimal places selected with the [2nd F] and [TAB] keys.

Example: [ON/C] [FSE] (To display FIX indicator)
[2nd F] [TAB] 3 (To fix the number of decimal places to 3)
5 [÷] 3 [=] → 1.667

- When a calculation result is to be used for further calculations the contents of the register will be used.

(2) SCI (SCIentific notation)

- Calculation result is displayed with scientific notation ($A \times 10^B$).

AD Download to read ad-free.

Since the mantissa part of the calculation result is displayed in accordance with the decimal place designation (TAB), the number of significant digits can be easily designated. The next digit after the specified number of decimal places is automatically rounded off.

Example: [ON/C] [FSE] (To display SCI indicator)
[2nd F] [TAB] [2] (To fix the number of decimal places to 2)
3 [÷] 7 [=] → 4.29-01 (4.29×10^{-1})

- When a calculation result is to be used for further calculations, the contents of the register will be used.

(3) ENG (ENGineering notation)

- Each calculation result is displayed on the basis of scientific notation ($A \times 10^B$). At this time its mantissa is displayed according to the decimal place designation (TAB) and the exponent is automatically set to a multiple of 3 (...−6, −3, 0, 3, 6...) for display. Therefore, any display can be easily read in units of K (kilo- 10^3) or m (milli- 10^{-3}), etc. that is commonly used in the engineering field.

知乎 首发于 计算器爱好者之家

Example ON/C FSE (To display ENG indicator)
2nd F TAB 2 (To fix the number of decimal places to 2)
3 ÷ 7 = → 428.57-03 (428.57×10^{-3})

- When a calculation result is to be used for further calculations, the contents of the register will be used.
(The next digit after the specified number of decimal places is automatically rounded off.)

(4) Blank (i.e., when none of FIX, SCI, and ENG is displayed)

- Each calculation result is displayed in the floating decimal point system. Calculation result is displayed on the basis of scientific notation if it is outside the range of $0.000000001 \leq |\times| \leq 9999999999$ or not zero.

The 2nd F and TAB keys are used to specify the number of decimal positions in a calculation result when the FIX, SCI, or ENG mode is set. The number of decimal places is specified by the numeral key (0 ~ 9) following the 2nd F and TAB keys. Carry over will be automatically rounded.

AD Download to read ad-free.

Use the 2nd F and TAB keys when the calculation result is displayed or when the calculator is cleared with the ON/C key.

Example:
If FIX mode is designated (To display FIX indicator)
2nd F TAB 9 (To fix the number of decimal places to 9)
5 ÷ 9 = → 0.555555556
2nd F TAB 8 → 0.55555556
2nd F TAB 7 → 0.5555556
2nd F TAB 0 → 1.

NOTES: (1) If a number cannot be displayed in the number of decimal places specified by the 2nd F and TAB keys, the number may be displayed in less than the number of decimal places specified by the 2nd F and TAB keys.

(2) The designated number of decimal places is retained even when the display system is changed or when the power is turned off.

AD Download to read ad-free.

3. Modify Function

The modify function causes the internal result of a calculation stored in memory when used in subsequent calculations, to be in agreement with the format of the result of the calculation in the display.
With the EL-506A, the result of a calculation is obtained to the accuracy of up to 12 digits for mantissa, while all the internally executed calculations are in the exponential form ($A \times 10^{B}$). The results of all the internal calculations are displayed on the LCD after being converted into the form designated by the display system (FIX, SCI, or ENG) and the number of decimal places to be fixed (TAB). So, the use of this modify function allows you to use the calculation result in the display without change, for the next calculation to be performed. This function is very useful when you must perform calculations with the significant digits of a number taken into account as in testing or processing the results of experiments.

知乎 首发于 计算器爱好者之家

AD Download to read ad free.

Example:
To solve for the result of 5 ÷ 9 = and then multiply the calculation result by 9
[FSE] (to display the FIX indicator)
[2nd F] [TAB] 1 (to fix the number decimal places to 1)

- Normal calculation
  5 [÷] 9 [=] → 0.6
  [×] 9 [=] → 5.0

- Calculation with modify function
  5 [÷] 9 [−] [2nd F] [MDF] → 0.6
  [×] 9 [=] → 5.4

NOTE: In a continuous calculation like this example, the value in the display is not used for the calculation. Instead, the value stored in register is used.

AD Download to read ad-free.

4. Trigonometric functions

Before you start any of the trigonometric and inverse trigonometric functions, you must first designate the unit of angle applicable to the function by using the [DRG] key. As you press this key consecutively, the indications "DEG", "RAD", and "GRAD" will appear alternately at the upper part of the display. Keep pressing the key until the desired angular unit is set on the display.

Example 1: sin 30° + cos 40°
Angular unit: DEG
Key in: 30 [sin] [+] 40 [cos] [=] Answer: 1.266044443

Example 2: cos 0.25 π
Angular unit: RAD
Key in: .25 [×] [2nd F] [π] [=] [cos] Answer: 0.707106781

NOTE: The designated angular unit will be retained in register even when the power is turned off. Therefore, you need not redesignate the angular unit each time the power is turned on.

AD Download to read ad free.

5. Inverse Trigonometric Functions

Example 1: $\sin^{-1}$ 0.5
Angular unit: DEG

Related titles

知乎 首发于 计算器爱好者之家

Before you start any of the trigonometric and inverse trigonometric functions, you must first designate the unit of angle applicable to the function by using the DRG key. As you press this key consecutively, the indications "DEG", "RAD", and "GRAD" will appear alternately at the upper part of the display. Keep pressing the key until the desired angular unit is set on the display.

Example 1: sin 30° + cos 40°
Angular unit: DEG
Key in: 30 [sin] [+] 40 [cos] [=] Answer: 1.266044443

Example 2: cos 0.25 π
Angular unit: RAD
Key in: .25 [×] [2nd F] [π] [=] [cos] Answer: 0.707106781

NOTE: The designated angular unit will be retained in register even when the power is turned off. Therefore, you need not redesignate the angular unit each time the power is turned on.

AD Download to read ad-free.

5. Inverse Trigonometric Functions

Example 1: $\sin^{-1}$ 0.5
Angular unit: DEG
Key in: .5 [2nd F] [$\sin^{-1}$] Answer: 30

Example 2: $\cos^{-1}$ −1
Angular unit: RAD
Key in: 1 [+/−] [2nd F] [$\cos^{-1}$] Answer: 3.141592654 (Value of π)

6. Hyperbolic and Inverse Hyperbolic Functions

When using any of the hyperbolic and inverse hyperbolic functions, the "HYP" indicator will appear at the upper part of the display.

Example 1: sinh 4
Key in: 4 [hyp] [sin] Answer: 27.2899172

NOTE: To enter a negative number, press the [+/−] key after the numeric entry.

Example 2: $\sinh^{-1}$ 9
Key in: 9 [2nd F] [arc hyp] [sin] Answer: 2.893443986

AD Download to read ad-free.

7. Squaring and Power

Example 1: 20^2
Key in: 20 [x^2] Answer: 400

Example 2: 3^3
Key in: 3 [y^x] 3 [=] Answer: 27

Example 3: 3^4
Key in: 3 [y^x] 4 [=] Answer: 81

8. Square Root, Cubic Root, and Radical Root

Example 1: $\sqrt{25}$
Key in: 25 [$\sqrt{\ }$] Answer: 5

Example 2: Find the cubic root of 27.
Key in: 27 [2nd F] [$\sqrt[3]{\ }$] Answer: 3

Example 3: Find the 4th root of 81.
Key in: 81 [2nd F] [$\sqrt[y]{\ }$] 4 [=] Answer: 3

知乎 首发于 计算器爱好者之家

9. Logarithmic Functions (Natural and Common Logarithms)

Example 1: ln 21
Key in: 21 [ln] Answer: 3.044522438

Example 2: log 173
Key in: 173 [log] Answer: 2.238046103

10. Exponential Functions

Example 1: $e^{3.0445}$
Key in: 3.0445 [2nd F] [e^x] Answer: 20.99952881 (21 as in paragraph 9 above.)

Example 2: $10^{2.238}$
Key in: 2.238 [2nd F] [10^x] Answer: 172.9816359 (173 as in paragraph 9 above.)

AD Download to read ad-free.

11. Reciprocals

Example: 1/6 + 1/7
Key in: 6 [2nd F] [1/x] [+] 7 [2nd F] [1/x] [=] Answer: 0.309523809

12. Factorial

Example: 69!
Key in: 69 [2nd F] [n!] Answer: 1.711224524 98 (1.711224524×10^{98})

Note that the Error section deals with the calculation range of the calculator.

13. Permutations and Combinations

Example 1: ₆P₃
Key in: 5 [2nd F] [nPr] 3 [=] Answer: 60

Example 2: ₆C₃
Key in: 5 [nCr] 3 [=] Answer: 10

AD Download to read ad-free.

14. Percent calculations

Example 1: What is 10% of 200?
Key in: 200 [×] 10 [2nd F] [%] [=] Answer: 20

Example 2: 9 equals what percent of 36?
Key in: 9 [÷] 36 [2nd F] [%] [=] Answer: 25 (%)

Example 3: What is 10% add-on to 200?
Key in: 200 [+] 10 [2nd F] [%] [=] Answer: 220

Example 4: What is 20% deduction from 500?
Key in: 500 [−] 20 [2nd F] [%] [=] Answer: 400

15. Random number generation

Random numbers are useful for "random sampling" in statistical calculations. Each time the [2nd F] and [RND] keys are pressed, random numbers are generated. The ran
places

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

Example: Taking 10 samples at random from numerous data.

Key in: [2nd F] [RND] Answer: 0.166 (16th data is taken as a sample.)

Key in: [2nd F] [RND] Answer: 0.840 (84th data is taken as a sample.)

Key in: [2nd F] [RND] Answer: 0.348 (34th data is taken as a sample.)

Repeat the above key operation until 10 samples are taken. If data once taken is specified again by the generated random number, generate another random number.

NOTE: Because random numbers are literally generated at random, of course the same numbers as shown above will not be generated.

16. Conversions of Angle/Time Calculations

To convert an angle in the sexagesimal system (in degrees, minutes, and sec-

AD Download to read ad-free.

onds) into its decimal equivalent (in degrees), it must be entered as its integer part and decimal fraction part, respectively.

Example 1: Convert 12° 47'52" to its decimal equivalent

Key in: 12.4752 [°'"] Answer: 12.79777778

When converting an angle in the decimal system (in degrees) into its sexagesimal equivalent (i.e., degrees, minutes, and seconds), the result of the conversion is broken down this way: integer part = degrees; 1st and 2nd decimal digits = minutes; 3rd and 4th digits = seconds; and the 5th and 6th digits = decimal seconds.

NOTE: The decimal fraction part of the conversion result will be displayed in six digits regardless of the number of decimal places specified by TAB (except when the integer part exceeds five digits).

Example 2: Convert 24.7256 into its sexagesimal equivalent

Key in: 24.7256 [2nd F] [°'"] Answer: 24.433216 or 24°43'32"

The EL-506A can also perform time calculations using the above angular conversion function.

AD Download to read ad-free.

Example 3: A racehorse has three trial records of 2 minutes 25 seconds, 2 minutes 38 seconds, and 2 minutes 22 seconds. What is the average running time of the horse?

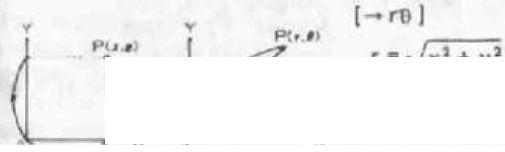
Key in: .0225 [°'"] [+] .0238 [°'"] [+] .0222 [°'"] [−] Answer 1: 0.123611111

Key in: [+] 3 [−] Answer 2: 0.041203703

Key in: [2nd F] [°'"] Answer 3: 0.022833

(the average time is 2 minutes 28 seconds)

17. Conversion of Coordinates



知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

The value of θ is obtained within the following limits:

DEG: $0 \leq |\theta| \leq 180$

RAD: $0 \leq |\theta| \leq \pi$

GRAD: $0 \leq |\theta| \leq 200$

Before starting the conversion, press the [DRG] key to designate the desired angular unit.

• Converting rectangular coordinates to polar coordinates (x,y→ r,θ)

Example 1: Solve for the values of polar coordinates (r,θ), with rectangular coordinates at point P (x=6, y=4), Angular unit: DEG

Key in: 6 [a] 4 [b] [2nd F] [→P] Answer: 7.211102551 (r)

Key in: [b] Answer: 33.69006753 (θ)

Immediately after completing the calculation, you can recall the value of r with the [a] key, and the value of θ, with the [b] key.

Example 2: Solve for the magnitude and direction (phase) in a vector with $\dot{I} = 12 + j9$

Key in: 12 [a] 9 [b] [2nd F] [→P] Answer: 15 (r)

Key in: [b] Answer: 36.86989765 (θ)

AD Download to read ad-free.

• Converting polar coordinates to rectangular coordinates (r, θ → x,y)

Example: Solve for the value of rectangular coordiantes (x, y) with polar coordinates at Point P (r=14, θ=π/3)

Angular unit: RAD

Key in: [ON/C] [2nd F] [π] [÷] 3 [=] [b] 14 [a] [2nd F] [→xy] Answer: 7 (x)

Key in: [b] Answer: 12.12435565 (y)

Immediately after completing the calculation, you can recall the value of x with the [a] key and the value of y with the [b] key.

In this example, the value of π/3 (value of θ) is first entered. This is because the value entered with the [a] or [b] key will be cleared if any of the four arithmetic operations is to be subsequently carried out. To avoid this, the value of θ is first determined and entered with the [b] key and then the value of r is entered with the [a] key.

AD Download to read ad-free.

NOTES: (1) If the conversion of coordinates is performed (or the [a] or [b] key is pressed) in the course of another calculation sequence, the intermediate result obtained up to that time or any pending operations in register will be cleared.

(2) When the STAT, 3-VLE, BIN, OCT, or HEX mode is in effect, coordinates conversion cannot be performed.

知乎 首发于 计算器爱好者之家

AD Download to read ad free.

COMPLEX NUMBER CALCULATION

The EL-506A can perform the addition, subtraction, multiplication, and division of complex numbers.

To carry out complex number calculations, the calculator must be first put in the Complex number (CPLX) mode, by pressing the [2nd F] key and the [CPLX] key. The "_" indicator will appear at the top part of the display below the legend "CPLX" to show that the calculator is in the CPLX mode. To clear this mode, press the [2nd F] key and the [CPLX] again and the "_" indicator will disappear.

A complex number is represented in the form of a + bi, where "a" is the real part of the complex number and "bi" is the imaginary part. Press the [a] key to enter the value of the real part, and the [b] key, the value of the imaginary part. Press the [=] key to obtain the result of the calculation.

AD Download to read ad-free.

NOTES: (1) In the CPLX mode, the four basic operations and coordinates conversion can be performed.

(2) In CPLX mode, memory calculations, constant calculations, and calculations with parentheses cannot be performed.

(3) If the value of either real part "a" or imaginary part "b" is 0, the calculation can be performed by entering the other part without value 0. In CPLX mode, [+], [−], [×], [÷], and [=] keys become inoperative unless the value of either of the two parts is input.

The four basic arithmetic operations of complex numbers can be performed using the following formulas:

Addition: $(a + bi) + (c + di) = (a + c) + (b + d)i$

Subtraction: $(a + bi) - (c + di) = (a - c) + (b - d)i$

Multiplication: $(a + bi) \times (c + di) = (ac - bd) + (ad + bc)i$

Division: $(a + bi) \div (c + di) = \frac{ac + bd}{c^2 + d^2} + \frac{bc - ad}{c^2 + d^2}i$

Example : (5 + 4i) + (6 + 3i) =

Key in: [2nd F] [CPLX] [ON/C]

AD Download to read ad-free.

5 [a] 4 [b] [+] 6 [a] 3 [b]

[=] Display: 11. (real part)

[b] Display: 7. (imaginary part)

Answer: 11 + 7i

[a] Display: 11. (recalls real part)

[b] Display: 7. (recalls imaginary part)

- Immediately after completing the calculation, you can recall the value of the real part with the [=] key, and the value of the imaginary part with the [b] key.
- A value

知乎 首发于 计算器爱好者之家

Example 2: (5+4i)−(6+3i) =
Key in: 5 a 4 b − 6 a 3 b
= Display: -1.
b Display: 1. Answer: -1 + 1i

AD Download to read ad-free.

Example 3: (5+4i)×(6+3i) =
Key in: 5 a 4 b × 6 a 3 b
= Display: 18.
b Display: 39.
Answer: 18 + 39i

Example 4: (5+4i)÷(6+3i)=
Key in: 5 a 4 b + 6 a 3 b
= Dislay: 0.933333333
b Display: 0.2
Answer: 0.933333333 + 0.2i

If the complex numbers are represented as polar coordinates, they must be input in the same manner as in Coordinates Conversion. (See page 39.)

AD Download to read ad-free.

BINARY, OCTAL, AND HEXADECIMAL NUMBER CALCULATIONS

The EL-506A can perform four basic arithmetic operations on binary, octal, and hexadecimal numbers as well as conversions between numbers expressed in these number systems. When performing calculations in each number system, first set the calculator in the desired number system mode before entering numbers. This calculator performs the following calculations in each mode in the same manner as in the decimal number mode; four basic calculations, calculation with parentheses, memory calculation, and constant calculation.

Number System Modes

Binary number system mode (BIN):

- Press the 2nd F and →BIN keys to put the calculation in the BIN (binary) mode, and the "▁" indicator appears on the top part of the display below the legend "BIN".
- In this mode, only number keys 0 and 1 can be used. The other number keys and decimal point key thus become inoperative.

Octal number system mode (OCT):

- Press the 2nd F and →OCT keys to put the calculation in the OCT (octal) mode, and

AD Download to read ad-free.

the "▁" indicator will appear at the top part of the display below the legend "OCT".

- In this mode, only numbers 0 to 7 can be used. The other number keys and decimal point key thus become inoperative.

Hexadecimal number system mode (HEX):

- Press
mode
the le

知乎 首发于 计算器爱好者之家

- To input hexadecimal numbers A to F in the HEX mode, press EXP, y^x, $\sqrt{}$, $\rightarrow$DEG, ln, log keys, respectively, and the letters printed in black at the right above the respective keys will be input.

Decimal number system mode (DEC):

- Press the 2nd F and $\rightarrow$DEC keys to put the calculator back in the normal DEC (decimal) mode. When these two keys are pressed no number system mode indicators will appear in the display.

AD Download to read ad-free.

- In normal mode numbers 0 through 9 are used to perform four basic operations and scientific calculations.

Now, convert decimal numbers 18 and 63 into their binary, octal and hexadecimal equivalent, respectively. If the BIN, OCT, or HEX indicator is being displayed, press the 2nd F and $\rightarrow$DEC keys to place the calculator in the normal decimal mode.

Conversion to Binary number

Key in: 18 2nd F $\rightarrow$BIN — Answer: 10010

2nd F $\rightarrow$DEC 63 2nd F $\rightarrow$BIN — Answer: 111111

Conversion to Octal number

Key in: 2nd F $\rightarrow$DEC 18 2nd F $\rightarrow$OCT — Answer: 22

2nd F $\rightarrow$DEC 63 2nd F $\rightarrow$OCT — Answer: 77

Conversion to Hexadecimal number

Key in: 2nd F $\rightarrow$DEC 18 2nd F $\rightarrow$HEX — Answer: 12

2nd F $\rightarrow$DEC 63 2nd F $\rightarrow$HEX — Answer: 3F

AD Download to read ad-free.

Now perform addition "18 + 63" using the values of the respective number systems.

Binary system

Key in: 2nd F $\rightarrow$BIN ON/C (Clears previously entered data.)

10010 + 111111 = — Answer: 1010001

(If you press the 2nd F and $\rightarrow$DEC keys, the result of the calculation can be viewed in the decimal number system.)

Octal system

Key in: 2nd F $\rightarrow$OCT ON/C

22 + 77 = — Answer: 121

Hexadecimal system

Key in: 2nd F $\rightarrow$HEX ON/C

12 + 3F = — Answer: 51

Decimal system

Key in: 2nd F $\rightarrow$DEC ON/C

18 + 63 = — Answer: 81

AD Download to read ad-free.

Examples: Mixed calculations

① Calculate ABCD (hexadecimal number) + 10 (decimal number) and output the result in h

Key in: 2nd F

10

知乎 首发于 计算器爱好者之家

sult in hexadecimal numbers.

Key in: 2nd F →HEX ON/C ABCD × 2nd F →DEC
2 =
2nd F →HEX Answer: 1579A

• In the BIN, OCT and HEX mode, a negative number is entered by using the NEG (+/−) key and displayed as a complement corresponding to the designated number system.

AD Download to read ad free.

Example: 2nd F →DEC 1 NEG → -1.
2nd F →BIN → 1111111111. (2's complement)
2nd F →OCT → 7777777777. (8's complement)
2nd F →HEX → FFFFFFFFFF. (16's complement)

• In the BIN, OCT and HEX mode, pressing the NEG key causes the number displayed to change from normal to complementary form or vice versa.

Example: 2nd F →BIN 111 → 111. (7)
NEG → 1111111001. (-7)
NEG → 111. (7)

NOTES: (1)Scientific calculations can be performed only in the decimal number system mode.
(2)The number of parentheses that can be used in a single calculation and the levels of pending operations in the binary, octal, or hexadecimal mode are the same as in the normal decimal mode.

AD Download to read ad-free.

(3)When a decimal number having a fraction part is converted into a binary, octal, or hexadecimal number, the fraction part will be truncated with only the integer part converted into the respective notation.

Example: 2nd F →DEC 12.34 2nd F →HEX → C.
2nd F →DEC → 12.

• If the result of a conversion is outside the calculation range, an error will result. In this case, however, mode switching is effective.

Example: 2nd F →DEC 512 → 512.
2nd F →BIN → E 0.

• If the result or intermediate result of a binary, octal or hexadecimal calculation turns to be a number with a fraction part, the result is displayed with its fraction part truncated.

Example: 2nd F →OCT 5 ÷ 2 = → 2.

AD Download to read ad-free.

知乎 首发于 计算器爱好者之家

Example 1: AND operation of binary numbers 1011 and 101
Key in: [ON/C] [2nd F] [→BIN] 1011 [AND] 101 [=] Answer: 1
Example 2: OR operation of hexadecimal numbers 5A and C3
Key in: [ON/C] [2nd F] [→HEX] 5A [OR] C3 [=] Answer: db.
Example 3: NOT operation of binary number 10110
Key in: [ON/C] [2nd F] [→BIN] 10110 [NOT] Answer: 1111101001
Example 4: Exclusive-OR operation of octal number 24 and 4
Key in: [ON/C] [2nd F] [→OCT] 24 [XOR] 4 [=] Answer: 20
Example 5: Exclusive-NOR operation of hexadecimal number B3 and 2D
Key in: [ON/C] [2nd F] [→HEX] B3 [XNOR] 2D [=] Answer: FFFFFFFF61

AD Download to read ad-free.

STATISTICAL CALCULATIONS

Statistical Calculation (STAT) Mode

- Before performing a single-variable statistical calculation or a probability density function calculation, you must place the calculator in the STAT mode. To do so, press the [2nd F] and [STAT] keys and the "—" indicator will appear at the top part of the display below the legend "STAT".
- In the STAT mode, binary, octal, and hexadecimal number calculations, conversions of coordinates and memory calculations cannot be done.
- To release the calculator from STAT mode, press the [2nd F] and [STAT] keys a second time. This mode is also released when the calculator is set in the CPLX mode or 3-VLE mode.

Single-variable Statistical Calculation

1. Statistics obtainable from calculation
   n: Number of samples
   Σx: Sum total of samples
   Σx^2: Sum of squares of samples

AD Download to read ad-free.

$\bar{x}$: Mean value of samples

$$\bar{x} = \frac{\Sigma x}{n}$$

s : Standard deviation with population parameter taken as "n-1".

$$s = \sqrt{\frac{\Sigma x^2 - n\bar{x}^2}{n-1}}$$

(Used to estimate the standard deviation of a population from the sample data extracted from that population.)

σ : Standard deviation with population parameter taken as "n".

$$\sigma = \sqrt{\frac{\Sigma x^2 - n\bar{x}^2}{n}}$$

(Used when all populations are taken as sample data or when finding the standard deviation of a population with samples taken as that population.)

AD

知乎 首发于 计算器爱好者之家

(1) Data [DATA] (used to enter data one by one)
(2) Data [×] Frequency [DATA] (used to enter two or more of the same data)

Example 1:
To solve for the mean value and standard deviation of the examination scores of 35 randomly selected students shown in the table below.

Data No.	Exam. scores	No. of students	Data No.	Exam. scores	No. of students
1	30	1	5	70	8
2	40	2	6	80	9
3	50	4	7	90	5
4	60	4	8	100	2

AD Download to read ad free.

Key in	Display	Remarks
[2nd F] [STAT]	0.	STAT mode is set.
30 [DATA]	1.	Number of input data
40 [×] 2 [DATA] 50 [×] 4 [DATA]	7.	Number of input data
60 [×] 4 [DATA] 70 [×] 8 [DATA]	19.	Number of input data
80 [×] 9 [DATA] 90 [×] 5 [DATA]	33.	Number of input data
100 [×] 2 [DATA]	35.	Number of input data
[x̄]	70.85714286	Mean value ($\bar{x}$)
[2nd F] [Σx]	2480.	Sum total of samples (Σx)
[2nd F] [Σx²]	185800.	Sum of squares of samples (Σx^2)
[n]	35.	Number of samples
[s]	17.21344013	Standard deviation s
[x²]	296.302521	Unbiased variance s^2
[2nd F] [STAT]	0.	STAT mode is released.

NOTE: Unbiased variance s^2 can be obtained from the standard deviation of samples S by pressing the [x²] key.

AD Download to read ad free.

- After the results of a statistical calculation such as mean value or standard deviation have been obtained, it is possible to enter additional information and continue doing statistical calculation on other data.
- The results of statistical calculations cannot be cleared with the [ON/C] key. Use the [2nd F] and [STAT] keys to clear statistics stored in memory before you start another statistical calculation.

AD

知乎 首发于 计算器爱好者之家

following table of frequency distribution.

(Temporary average: 4,250,000)

No.	Class mark	Deviation*	Frequency
1	4,245,125	−4,875	1
2	4,246,380	−3,620	2
3	4,247,635	−2,365	3
4	4,248,890	−1,110	5
5	4,250,145	145	8
6	4,251,400	1,400	6
7	4,252,655	2,655	4
8	4,253,910	3,910	2

*Deviations in the above table indicate the deviation of each class mark from the temporary average of the class scores and have been obtained by the formula:

Deviation = student score − temporary average

AD Download to read ad-free.

Key in	Display	Remarks
2nd F STAT	0.	STAT mode is set.
4875 +/− DATA	1.	Number of input data
3620 +/− × 2 DATA	3.	Number of input data
2365 +/− × 3 DATA	6.	Number of input data
1110 +/− × 5 DATA	11.	Number of input data
145 × 8 DATA	19.	Number of input data
1400 × 6 DATA	25.	Number of input data
2655 × 4 DATA	29.	Number of input data
3910 × 2 DATA	31.	Number of input data
s	2185.379202	Standard deviation of samples of population (s)
2nd F σn	2149.842213	Standard deviation of samples of population (σ)
x̄	104.516129	Mean value
+ 4250000 =	4250104.516	Average of class marks
2nd F STAT	0.	STAT mode is released.

AD Download to read ad-free.

In the above example, deviations are used as the data for calculation. In case of large values such as the class marks in Example 2, the results of calculations x^2, $\bar{x}^2$ and $n\bar{x}^2$ will exceed the 12-digit internal capacity of the calculator and the lower digits of a result exceeding this capacity will be truncated. This will certainly result in rather inaccurate standard deviation.

3. Data entry correction

If an erroneous data has been entered, the incorrect entry can be corrected using the CD key.

Example:

To correct the score of data No. 3 erroneously entered as 55 instead of 50 in Example 1 of the above data entry operation.

Key in	Display	Remarks
2nd F STAT	0.	STAT mode is set.
30 DATA	1.	
40 × 2 DATA	3.	
55 × 4 DATA	7.	Incorrect data is

知乎 首发于 计算器爱好者之家

55 × 4 2nd F CD

50 × 4 DATA

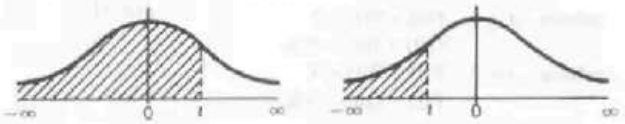
2nd F STAT

3. Incorrect data is cleared.
7. Correct data is input.
0. STAT mode is released.

Probability Calculation with Random Variable of Normal Distribution

- In STAT mode, the following three probability density functions with random variables of normal distribution can be obtained.

① $P(t)=\frac{1}{\sqrt{2\pi}}\int_{-\infty}^{t} e^{-\frac{x^2}{2}}dx$



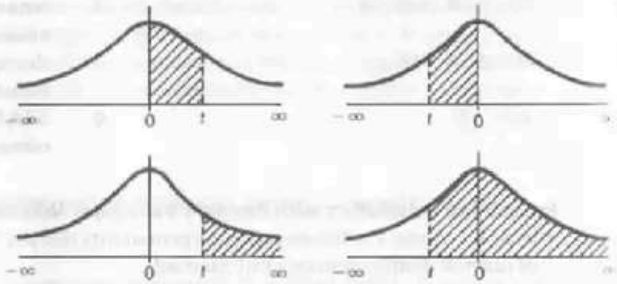
$(t\geq 0)$ $(t<0)$

AD Download to read ad-free.

② $Q(t)=\frac{1}{\sqrt{2\pi}}\int_{0}^{t} e^{-\frac{x^2}{2}}dx$ $(t\geq 0)$

$\left(Q(t)=\frac{1}{\sqrt{2\pi}}\int_{t}^{0} e^{-\frac{x^2}{2}}dx\right)$ $(t<0)$

③ $R(t)=\frac{1}{\sqrt{2\pi}}\int_{t}^{\infty} e^{-\frac{x^2}{2}}dx$



$(t\geq 0)$ $(t<0)$

where $t\geq 0$ $P(t)+R(t)=1$
$Q(t)+R(t)=0.5$
where $t<0$ $P(t)+R(t)=1$
$P(t)+Q(t)=0.5$

NOTE: P(t), Q(t), and R(t) will always take a positive value, because these functions are used with the same principle as in solving for an area.

AD Download to read ad-free.

- t is the function for converting a random variable of normal distribution $N(\bar{x}, \sigma)$ into that of standard normal distribution N(0, 1). The standardization conversion formula is as follows:

$$t=\frac{x-\bar{x}}{\sigma}$$

where
x : random variable of normal distribution
$\bar{x}$: mean value
σ : standard deviation with population taken as n

- With the EL-506A, the values of P(t), Q(t), and R(t) can be obtained down to the sixth decimal place.

Related titles

知乎 首发于
计算器爱好者之家

知乎 首发于 计算器爱好者之家

- t is the function for converting a random variable of normal distribution $N(\bar{x}, \sigma)$ into that of standard normal distribution N(0, 1). The standardization conversion formula is as follows:

$$t = \frac{x - \bar{x}}{\sigma}$$

where

x : random variable of normal distribution
$\bar{x}$: mean value
σ : standard deviation with population taken as n

- With the EL-506A, the values of P(t), Q(t), and R(t) can be obtained down to the sixth decimal place.

AD Download to read ad free.

Example 1:
The following table shows the distribution of the results of a test taken by 50 students. First find the average score of all students. Then determine the percentages of those students who received scores (1) below 35, (2) between the average and 75, and (3) above 85, respectively.

Test score	20	30	40	50	60	70	80	90
No. of students	1	3	5	8	13	10	7	3

Key in	Display	Remarks
2nd F STAT	0.	STAT mode is set.
20 × 1 DATA	1.	
30 × 3 DATA	4.	
40 × 5 DATA	9.	
50 × 8 DATA	17.	
60 × 13 DATA	30.	
70 × 10 DATA	40.	

AD Download to read ad free.

80 × 7 DATA	47.	
90 × 3 DATA	50.	
$\bar{x}$	60.4	Average score
2nd F σ	16.48757108	Standard deviation σ
35 2nd F t	−1.54055439	t taken as x = 35
2nd F P(t)	0.061713	Answer for (1): 6.2%
75 2nd F t	0.885515515	t taken as x = 75
2nd F Q(t)	0.312061	Answer for (2): 31%
85 2nd F t	1.492032992	t taken as x = 85
2nd F R(t)	0.067845	Answer for (3): 6.8%
2nd F STAT	0.	STAT mode is released.

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

Example 2:
From the table in Example 1 above, find the percentage of those students who received scores between 65 and 75.

Key in	Display	Remarks
2nd F STAT	0.	STAT mode is set.
20 × 1 DATA 30 × 3 DATA	4.	
40 × 5 DATA 50 × 8 DATA	17.	
60 × 13 DATA 70 × 10 DATA	40.	
80 × 7 DATA 90 × 3 DATA	50.	
75 2nd F t 2nd F P(t) −	0.812061	81% (scores with 75 or below)
65 2nd F t 2nd F P(t)	0.609877	61% (scores with 65 or below)
=	0.202184	Answer: 20%
2nd F STAT	0.	STAT mode is released.

AD Download to read ad-free.

3-VLE CALCULATION

The EL-506A has a special calculation mode called "3-VLE" to solve for simultaneous linear equations with three unknowns.

- With this calculator, simultaneous linear equations with three unknowns x, y, and z

$$\begin{cases} a_1x + b_1y + c_1z = d_1 \\ a_2x + b_2y + c_2z = d_2 \\ a_3x + b_3y + c_3z = d_3 \end{cases}$$

are solved using the following determinant:

$$\begin{pmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} d_1 \\ d_2 \\ d_3 \end{pmatrix}$$

Value of determinant consisting of coefficients $= \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_1 & b_2 & c_3 \end{vmatrix}$

AD Download to read ad-free.

- To set 3-VLE mode, press the 2nd F and 3-VLE keys and the indicator "_" will appear at the top part of the display below the legend "3-VLE". To release 3-VLE mode, press the 2nd F and 3-VLE keys a second time. This mode is also released when the calculator is put in BIN, OCT, HEX, DEC, CPLX, or STAT mode.

NOTE: Calculations for simultaneous linear equations with 3 unknowns cannot be performed on this calculator when constants d1, d2 and d3 are 0.

1. Input of Coefficients

- Coefficient $a_1, b_1, c_1, d_1, \ldots d_3$ of the simultaneous linear equations will then appear on the display in their order in the equations. Enter each coefficient and press the ENT key accord
- Upon displa

知乎 首发于 计算器爱好者之家

• Depression of the [ENT] key following the display of the determinant value causes the calculator to return to the wait state for entry of the first coefficient a_1. At this point, the value of a_1 stored in memory is on the display.

AD Download to read ad-free.

NOTE: Memory M2 is used for calculations in 3-VLE mode. For this reason, the contents of M2 are automatically cleared when instant the calculator is put in 3-VLE mode.

Example:

Solve for the following simultaneous linear equations with three unknowns and the value of the determinant.

$$\begin{cases} x + y - z = 9 \\ 6x + 6y - z = 17 \\ 14x - 7y + 2z = 42 \end{cases}$$

AD Download to read ad-free.

Key in	Display		Remarks
[2nd F] [3-VLE]	A1	0.	3-VLE mode is set.
1	A1	1.	Input of a_1
[ENT]	b1	0.	Input of b_1
1 [ENT]	c1	0.	Input of c_1
1 [+/-] [ENT]	d1	0.	Input of d_1
9 [ENT]	A2	0.	
⋮	⋮		
2 [ENT]	d3	0.	Last input d_3
42 [ENT]		3.238095238	Solution for x
[ENT]		−1.638095238	Solution for y
[ENT]		−7.4	Solution for z
[ENT]		105.	Value of determinant
[ENT]	A1	1.	

NOTE:
- Coefficients a_1, a_2, and a_3 and c_1, c_2, and c_3 are respectively displayed as A1, A2, and A3 and C_1, C_2, and C_3 when the calculator asks you to input the coefficients.
- When verifying values of x, y, and z obtained in the 3-VLE mode by substituting them with the original equations, the result of the left side of an equation may not agree with that of its right side, because the calculator performs the verification using the results of calculations rounded internally by its modify function.

AD Download to read ad-free.

2. Entry confirmation and correction

- After the input of a certain coefficient with the [ENT] key, the data entry can be confirmed by pressing the [2nd F] and [ENT] keys.
- All the coefficients entered and the value of the determinant can be viewed in sequence as many time as required by pressing the [ENT] key consecutively.

Example To confirm the value of coefficient a_1

Key in	Display		Remarks
[ON/C]	A1	0.	
123 [ENT]			
[2nd F] [ENT]			

- The incorre

知乎 首发于 计算器爱好者之家

	A1	123.
245	A1	245.
ENT	b1	0.

73

AD Download to read ad free.

Example 2: To correct the incorrect entry of 245 to 0

Key in	Display	
2nd F ENT	A1	245.
ON/C	A1	0.
ENT	b1	0.

- If the ON/C key is pressed while one of the solutions x, y, and z or the value of the determinant is on display, the calculator returns to the wait state for entry of the first coefficient a1.

NOTES: (1) When the value of the determinant turns out to zero, solutions for unknowns x, y, and z cannot be identified and error will occur.

(2) When the 3-VLE mode is released, all the coefficient data entered will be cleared from memory. These data, however, will be retained in memory even when the calculator is powered off or is in an error condition.

74

AD Download to read ad free.

3. Entry and display of coefficients

- With the calculator in the wait state for entry of a coefficient, a number (consisting of 4-digit mantissa and 1-digit exponent) can be entered within the following input range: $1\times10^{-6} \leq |x| \leq 9.999\times10^{6}$

NOTE: If the absolute value of a number entered is less than 1×10^{-6}, the numeric entry will result in 0. If the absolute value of a number entered is greater than 9.999×10^{6}, the numeric entry will be handled as an error.

- The result of addition, subtraction, multiplication, or division can be entered as a coefficient, but within the input range as described above.

Example: Entry of 1/3

1 ÷ 3 ENT ---- 3.333×10^{-1} (Stored in memory)

In this case, if the calculation result exceeds 4 in the number of significant digits, the 5th digit of the result will be rounded.

NOTE: In the 3-VLE mode, scientific calculations, memory calculations, and parenthesized calculations cannot be performed.

75

AD Download to read ad free.

- The values of all coefficients ($a_1, b_1, c_1 \ldots d_3$) will be displayed in the floating decimal point system but within the range of 4-digit mantissa part (without being affected by the decimal point system currently in effect by the FSE and 2nd F TAB keys). In this case, however, if the value of a coefficient is within the range of $0.001 < |x| < 0.999$, the significant 4 digits of the value will be preferentially displayed in the scientific notation as shown in the example below.

Key in

8 ÷ 9

2nd F ENT

知乎 首发于 计算器爱好者之家

of $0.000000001 < |x| < 0.000009999$, the significant four digits of the value will be displayed preferentially.

AD Download to read ad-free.

- If an error occurs during the entry of a coefficient value, the value of the coefficient entered immediately before the error is retained in memory and will be displayed after the error condition has been cleared by the [ON/C] key.

Key in	Display	
	C3	123.
9999 [EXP] 9 [ENT]	$_{E}$C3	0.
[ON/C]	C3	123.

- If an error occurs during the calculation of any of the solutions x, y, and z or the value of the determinant, all the values of the coefficients entered before the error are retained in memory. The calculator will return to the wait state for entry of coefficient a_1 after the error condition has been cleared by the [ON/C] key.

Key in	Display	
	$_{E}$ ^{x}	0.
[ON/C]	A1	123. (For example)

AD Download to read ad-free.

ERRORS

In the case of an error, Error indicator "E" will appear at the extreme lower left part of the display. An error will be caused by an operation beyond the calculation range of the calculator or any illegal operation. An error can be cleared by pressing the [ON/C] key.

Supplementary 2—Error Conditions

An error will occur in the calculator under any of the following conditions:

1. When the absolute value of a calculation result is greater than or equals to 1×10^{100}.
2. When division by 0 (zero) was attempted. (Ex. 5 [÷] 0 [=])
3. When the pending operation exceeds four levels.
4. When the [(] key is pressed 16 consecutive times or more in a single calculation.
5. When an operation beyond the calculation range was attempted. (See CALCULATION RANGE below.)
6. When an attempt was made to perform a logical operation in other than BIN, OCT, and HEX modes. (Ex. [2nd F] [HEX] A [AND] B [2nd F] [DEC] [=])
7. When an attempt was made to enter the value of a coefficient exceeding the range of 9.999×10^{6} in 3-VLE mode.

AD Download to read ad-free.

8. When an attempt was made to calculate y^{x}, $\sqrt[x]{y}$, nPr, and nCr in BIN, OCT, or HEX mode. (Ex. [2nd F] [DEC] 5 [nCr] 3 [2nd F] [HEX] [=])
9. When a calculation resulting in more than two pending operations is executed in STAT or 3-VL

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

CALCULATION RANGE

- Entries and four basic arithmetic calculations:
  Entry, 1st operand, 2nd operand: $\pm 1 \times 10^{-99}$ to $\pm 9.999999999 \times 10^{99}$ and 0
  Calculation result: $\pm 1 \times 10^{-99}$ to $\pm 9.999999999 \times 10^{99}$ and 0

  Note: When the absolute value of numeric entry and the result of a calculation is less than 1×10^{-99}, the calculator regards the value as 0 in calculation or display.

- **Scientific and special functions:**

Functions	Dynamic range
sin x cos x tan x	DEG: $\|x\| < 1 \times 10^{10}$ RAD: $\|x\| < \frac{\pi}{180} \times 10^{10}$ GRAD: $\|x\| < \frac{10}{9} \times 10^{10}$

AD Download to read ad-free.

Functions	Dynamic range
sin x cos x tan x	With tan x, however, an error occurs in the following cases: DEG: $\|x\| = 90\ (2n - 1)$ RAD: $\|x\| = \frac{\pi}{2}\ (2n - 1)$ (n: integer) GRAD: $\|x\| = 100\ (2n - 1)$
$\sin^{-1} x$ $\cos^{-1} x$	$-1 \leq x \leq 1$
$\tan^{-1} x$	$\|x\| < 1 \times 10^{100}$
ln x log x	$1 \times 10^{-99} \leq x < 1 \times 10^{100}$
e^x	$-1 \times 10^{100} < x \leq 230.2585092$
10^x	$-1 \times 10^{100} < x < 100$

AD Download to read ad-free.

Fu

知乎 首发于 计算器爱好者之家

$\sqrt[x]{y}$	$y > 0$: $-1 \times 10^{100} < \frac{1}{x}\log y < 100$, $(x \neq 0)$ $y = 0$: $0 < x < 1 \times 10^{100}$ $y < 0$: $-1 \times 10^{100} < \frac{1}{x}\log\lvert y\rvert < 100$ where x: odd number or $\frac{1}{x}$: integer $(x \neq 0)$
sinh x cosh x tanh x	$-227.9559242 \leq x \leq 230.2585092$

82

AD Download to read ad-free.

Functions	Dynamic range
$\sinh^{-1} x$	$\lvert x\rvert < 1 \times 10^{50}$
$\cosh^{-1} x$	$1 \leq x < 1 \times 10^{50}$
$\tanh^{-1} x$	$\lvert x\rvert < 1$
$\sqrt{x}$	$0 \leq x < 1\times10^{100}$
$\sqrt[3]{x}$	$\lvert x\rvert < 1\times10^{100}$
x^2	$\lvert x\rvert < 1\times10^{50}$
$\frac{1}{x}$	$\lvert x\rvert < 1\times10^{100}$ $(x \neq 0)$.
n!	$0 \leq n \leq 69$ (n: integer)
nCr nPr	$0 \leq r \leq n \leq 69$ (r,n: integer)

83

AD Download to read ad-free.

Functions	Dynamic range
→ DEG. → D.MS	$\lvert x\rvert < 1\times10^{10}$ The function will remain ineffective for any number outside this range (but error indicator "E" will not appear).
x,y → r,θ	$\lvert x\rvert < 1\times10^{50}$, $\lvert y\rvert < 1\times10^{50}$ $x^2 + y^2 < 1\times10^{100}$ $\lvert\frac{y}{x}\rvert < 1\times10^{100}$
r,θ → x,y	$0 \leq r < 1\times10^{100}$ θ is in the same condition as x in sin x and cos x.
DRG▶	DEG → RAD: $\lvert x\rvert < 1\times10^{100}$ RAD → GRAD: $\lvert x\rvert \leq 1.570796326\times10^{98}$ GRAD → DEG: $\lvert x\rvert < 1\times10^{100}$.

84

AD Download to read ad-free.

Functi

知乎 首发于 计算器爱好者之家

→BIN	BIN: 1000000000 ≤ x ≤ 1111111111 0 ≤ x ≤ 111111111
→OCT	OCT: 4000000000 ≤ x ≤ 7777777777 0 ≤ x ≤ 3777777777
→HEX	HEX: FDABF41C01 ≤ x ≤ FFFFFFFFFF 0 ≤ x ≤ 2540BE3FF
Logical operation (AND, OR, XOR, XNOR)	Same as the above conversions except DEG

85

AD Download to read ad-free.

Functions	Dynamic range
Binary/Octal/ hexa decimal number calculations NOT	BIN: 1000000000 ≤ x ≤ 1111111111 0 ≤ x ≤ 111111111 OCT: 4000000000 ≤ x ≤ 7777777777 0 ≤ x ≤ 3777777777 HEX: FDABF41C01 ≤ x ≤ FFFFFFFFFF 0 ≤ x ≤ 2540BE3FE
NEG	BIN: 1000000001 ≤ x ≤ 1111111111 0 ≤ x ≤ 111111111 OCT: 4000000001 ≤ x ≤ 7777777777 0 ≤ x ≤ 3777777777 HEX: FDABF41C01 ≤ x ≤ FFFFFFFFFF 0 ≤ x ≤ 2540BE3FF
Others	The ranges for entries and calculation results in each mode are the same as above conversions.

86

AD Download to read ad-free.

Functions	Dynamic range
Complex number	In (A + Bi) $\frac{+}{-}$ $\times$ $\div$ (C + Di):
Addition, Subtraction	$\lvert A \pm C \rvert < 1 \times 10^{100}$ $\lvert B \pm D \rvert < 1 \times 10^{100}$
Multiplication	$\lvert x \rvert < 1 \times 10^{100}$ where x: result or intermediate result of calculation (AC−BD) or (AD + BC).
Division	$\lvert x \rvert < 1 \times 10^{100}$ $(C^2 + D^2 \neq 0)$ where x: result or intermediate result of calculation $(AC+BD)/(C^2+D^2)$ or $(BC-AD)/(C^2+D^2)$

87

AD

知乎 首发于 计算器爱好者之家

Statistical calculation	DATA: $\lvert x \rvert < 1\times10^{50}$ CD: $\lvert \Sigma x \rvert < 1\times10^{100}$ $\lvert n \rvert < 1\times10^{100}$ $\Sigma x^2 < 1\times10^{100}$ $\bar{x}$: $n \neq 0$ s: $0 \leq \frac{\Sigma x^2 - n\bar{x}^2}{n-1} < 1\times10^{100}, n>1$ σ: $0 \leq \frac{\Sigma x^2 - n\bar{x}^2}{n} < 1\times10^{100}, n>0$ t: $0 \leq \frac{\Sigma x^2 - n\bar{x}^2}{n-1} < 1\times10^{100}, n \neq 0$ P(t), Q(t), R(t): $\lvert t \rvert < 1\times10^{100}$

AD Download to read ad-free.

Functions	Dynamic range
Value of determinant	$\lvert a_1(b_2c_3-b_3c_2) - b_1(a_2c_3-a_3c_2) + c_1(a_2b_3-a_3b_2) \rvert < 1\times10^{100}$
Simultaneous linear equations with unknowns x, y, z (3-VLE)	value of determinant $\neq 0$

As a rule, the error of functional calculations is ±1 at the lowest digit (i.e., 10th digit) of a displayed numeric value (at the lowest digit of mantissa in the case of scientific notation) within the above calculation range.
However, in continuous calculations, the accuracy will reduce near the singular points and inflection points of functions because of the errors accumulated at each stage of the calculations.

End of Supplementary 2

AD Download to read ad-free.

Supplementary 3 – Detailed Reviews

OPERATING CONTROLS

OFF

Power Off Key
When this key is pressed, the power supply of the calculator is turned off.
Automatic Power-Off Function (APO)
To save battery power, this calculator is automatically powered off if no key is pressed for about 13 minutes after the power is turned on.

STAT
ON/C

Power On and Clear/Statistical Calculation Mode Key
ON/C : Press this key to turn the power supply of the calculator on and the calculator is ready for operation. When pressed during an operation, all the data (numbers and calculation commands) in the calculator except the memory contents are cleared.
2nd F STAT : Used to set or reset the STAT (statistical calculation) mode. When the calculator is set to the STAT mode by these keys, the "—" appears at the top part of the display below the legend

知乎 首发于 计算器爱好者之家

"STAT", and at the same time, the numerical values and calculation commands except for memory contents are cleared. In this mode the [)], [x→M], [RM] and [M+] keys function as the [n], [x̄], [s] and [DATA] keys, respectively. Pressing these keys after the [2nd F] key causes them to function as the [Σx], [Σx²], [σ] and [CD] keys. Also in this mode, the [÷], [×], [−], and [+] keys after the [2nd F] key function as the [t], [P(t)], [Q(t)] and [R(t)] keys, respectively.

2nd F

2nd Function Designation Key

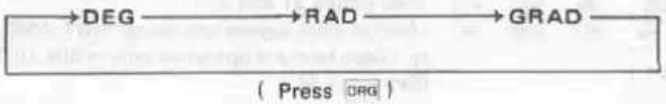
Used to designate the second function of another key.

DRG▸

DRG

Degrees·Radians·Grads Selector/Angular Unit Conversion Key.

[DRG] : Used to designate the unit of angle for calculation of trigonometric and inverse trigonometric functions and for coordinates conversion. Each depression of this key causes the angular unit to be changed from one unit to another.



(Press [DRG])

91

Download to read ad-free.

Ex. DEG → GRAD: Press the [DRG] key twice.
"DEG" – Entries and answers are in decimal degrees.
"RAD" – Entries and answers are in radians.
"GRAD" – Entries and answers are in grads.
(100 g = 90° = π/2 RAD)

[2nd F] [DRG▸] : Converts the angular unit from one unit to another. Also converts the displayed number into a number in the specified angular unit.

archyp

hyp

Hyperbolic/Inverse Hyperbolic Function Key

[hyp] : Used to calculate the respective hyperbolic and inverse hyperbolic functions. (See page 32.)

[2nd F] [echng]

sin⁻¹ NOT

sin

cos⁻¹ AND

cos

tan⁻¹ OR

tan

Trigonometric/Inverse Trigonometric Function/Logical Operator Keys

[sin], [2nd F] [sin⁻¹] : Used to calculate the respective trigonometric and inverse trigonometric functions. (See pages 31 and 32.)

[cos], [2nd F] [cos⁻¹]

[tan], [2nd F] [tan⁻¹]

[NOT], [AND], [OR] : Used to enter logical operators "NOT, AND, and OR", respectively. These keys are operative only in BIN, OCT, and HEX modes. (See page 54.)

92

Download to read ad-free.

TAB

FSE

Display Mode Designation/Tabulation Key

[FSE] : Used to select the display mode from FIX, SCI, and ENG.

[2nd F] [TAB] : Used to fix the number of decimal places in a calculation result. (See page 25.)

n!

CE

Clear Entry/Factorial Key

[CE] : Used to clear an incorrectly entered number.
123 [+] 455 [CE] 456 [=] → 579.

[2nd F] [n!] : Used to calculate the factorial of the displayed number.
Factorial of n(n!) = n·(n−1)·(n−2)·····2·1
(See page 35.)

→D.MS D

→DEG

Degrees, Minutes and Seconds ↔ Decimal Degrees Conversion/Hexadecimal Number "D" key

[→DEG] : Used to convert an angle between the sexagenary and decimal notation systems. (See page 38.)

[2nd F] [→D.MS]

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

D : Used to enter hexadecimal number "D". This key is effective only in HEX mode.

Natural Logarithm/Antilogarithm/Hexadecimal Number "E" key

ln : Used to obtain the logarithm with base e (e = 2.718281828). (See page 34.)

2nd F eˣ : Used to calculate the antilogarithm with base e of the displayed number. (See page 34.)

E : Used to enter hexadecimal number "E". This key is effective only in HEX mode.

Common Logarithm/Common Antilogarithm/Hexadecimal Number "F" Key

log : Used to obtain the logarithm with base 10. (See page 34.)

2nd F 10ˣ : Used to calculate the antilogarithm with base 10. (See page 34.)

F : Used to enter hexadecimal number "F". This key is effective only in HEX mode.

AD Download to read ad-free.

Real Part Entry/Coordinates Conversion/Logical Operator Key

a : Used to enter the real part of a complex number in CPLX mode and to call the real part after the complex number calculation has been executed. (See page 43.)
Also used to enter the value of r or x for conversion between rectangular coordinates and polar coordinates and to call the converted value of r or x. (See page 40.)

2nd F →r θ : Converts rectangular coordinates into polar coordinates. (See page 40.)

XOR : Used to enter logical operator "XOR" (exclusive OR) in BIN, OCT, or HEX mode. (See page 54.)

Imaginary Part Entry/Coordinates Conversion/Logical Operator Key

b : Used to enter the imaginary part of a complex number in CPLX mode and to call the imaginary part after the complex number calculation has been executed. (See page 43.)
Also used to enter the value of y or θ for conversion between rectangular coordinates and polar coordinates and to call the converted value of y or θ. (See page 40.)

AD Download to read ad-free.

2nd F →xy : Converts polar coordinates into rectangular coordinates. (See page 41.)

XNOR : Used to enter logical operator "XNOR" (exclusive NOR) in BIN, OCT, or HEX mode. (See page 54.)

Right Shift/Modify Key

→ : Used during or immediately after the entry of a number to shift the least significant digit of the number to the right.

Example:	Key in	Display
	12356 → →	→ 123.
	45 →	12345.
	5 EXP 24 → →	→ 5. 00

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

Exponent/Pi/Hexadecimal Number "A" Key

EXP : Used to enter the exponent part of a number.

2nd F π : Used to enter the constant π (π = 3.141592654)

A : Used to enter hexadecimal number "A". This key is effective only in HEX mode. (See page 48.)

Power/Radical Root/Hexadecimal Number "B" Key

y^x : Used to raise a number to a power. (See page 33.)

2nd F $\sqrt[y]{y}$: Used to obtain the radical (power) root of a number. (See page 33.)

B : Used to enter hexadecimal number "B". This key is effective only in HEX mode. (See page 48.)

Square Root/Cubic Root/Hexadecimal Number "C" Key

$\sqrt{}$: Used for square root calculations. (See page 33.)

2nd F $\sqrt[3]{}$: Used for cubic root calculations. (See page 33.)

C : Used to enter hexadecimal number "C". This key is effective only in HEX mode. (See page 48.)

AD Download to read ad-free.

Square/Reciprocal Key

x^2 : Used for squaring. (See page 33.)

2nd F 1/x : Used for reciprocal calculations. (See page 35.)

Open Parenthesis/Exchange Key

(: Used to enter an open parenthesis. (See page 14.)

2nd F t : Used to replace the number being displayed (in x register) with that stored in the working (y) register.

Example: Key in Display

3 y^x 4 → 4.

2nd F t → 3.

= → 64. (4^3 has been calculated.)

Closed Parenthesis/Statistical Calculation Key

) : Used to enter a closed parenthesis. (See page 14.)

n : Used to obtain the number of samples (data) entered in STAT mode. (See page 55.)

2nd F Σx : Used to obtain the sum total of the data entered in STAT mode. (See page 55.)

AD Download to read ad-free.

Numeral keys

0 – 9 : Used to enter numbers 0 through 9.

Random Number Key

2nd F RND : Used to generate random numbers ranging from 0.000 to 0.999. (See page 37.)

NOTE: Random number generation is not possible in BIN, OCT, HEX, or 3-VLE mode.

Division/Binary Number Mode/Statistical Calculation Key

÷ : Pressed for division.

Related titles

知乎 首发于 计算器爱好者之家

(9

Random Number Key

2nd F RND : Used to generate random numbers ranging from 0.000 to 0.999. (See page 37.)
NOTE: Random number generation is not possible in BIN, OCT, HEX, or 3-VLE mode.

→BIN t ÷

Division/Binary Number Mode/Statistical Calculation Key

÷ : Pressed for division.
2nd F →BIN : Used to set or reset the binary number system (BIN) mode. Also used to convert the number displayed into a binary number. (See page 47.)
2nd F t : Used to convert random variable of normal distribution into that of standard normal distribution. This key is effective only in STAT mode. (See page 63.)

AD Download to read ad-free.

→OCT P(t) ×

Multiplication/Octal Number Mode/Statistical Calculation Key

× : Pressed for multiplication.
2nd F →OCT : Used to set or reset the octal number system (OCT) mode. Also used to convert the number displayed into an octal number.
2nd F P(t) : Used for probability calculations with random variable of normal distribution. This key is effective only in STAT mode. (See page 63.)

→HEX Q(t) −

Minus/Hexadecimal Number Mode/Statistical Calculation Key

− : Pressed for subtraction.
2nd F →HEX : Used to set or reset the hexadecimal number system (HEX) mode. Also used to convert the number displayed into a hexadecimal number.
2nd F Q(t) : Used for probability calculations with random variable of normal distribution. This key is effective only in STAT mode. (See page 63.)

AD Download to read ad-free.

→DEC R(t) +

Plus/Decimal Number Mode/Statistical Calculation Key

+ : Pressed for addition.
2nd F →DEC : Used to set the decimal number system (DEC) mode (normal mode). Also used to convert the number displayed into a decimal number. (See page 48.)
2nd F R(t) : Used for probability calculations with random variable of normal distribution. This key is effective only in STAT mode. (See page 63.)

$\bar{x}$ Σx^2 $x \rightarrow M_1$ $x \rightarrow M_2$

Memory In/Statistical Calculation Key

$x \rightarrow M_1$: Used to clear the contents of memory M1 and then store the displayed number in memory M1.
To clear the contents of memory M1, press the ON/C key followed by the $x \rightarrow M_1$ key. (See page 20.)
2nd F $x \rightarrow M_2$: Used to clear the contents of memory M2 and then store the displayed number in memory M2.
To clear the contents of memory M2, press the ON/C key followed by the 2nd F $x \rightarrow M_2$ keys. (See page 20.)

知乎 首发于 计算器爱好者之家

$\bar{x}$: Used to obtain the mean value of data x entered in STAT mode.

2nd F Σx^2 : Used to obtain the sum of squares of each data entered in STAT mode. (See page 55.)

s σ

RM1 RM1

Recall Memory/Statistical Calculation Key

RM1 : Used to display the contents of the memory M1. The memory contents remain unchanged after this key operation. (See page 20.)

2nd F x→M2 : Used to display the contents of the memory M2. The memory contents remain unchanged after this key operation. (See page 20.)

s : Used to obtain the standard deviation of the sample of data entered in STAT mode. (See page 55.)

2nd F σ : Used to obtain the standard deviation of the population of data entered in STAT mode. (See page 55.)

AD Download to read ad-free.

DATA CD

M1+ M1+

Memory Plus/Enter Data/Correct Data Key

M1+ : Used to add the displayed number or a calculation result to the contents of memory M1. To subtract a number from the memory contents, press the +/− and M1+ keys in this order. (See page 20.)

2nd F M2+ : Used to add the displayed number or a calculation result to the contents of memory M2. To subtract a number from the memory contents, press the +/− and 2nd F M2+ keys in this order. (See page 20.)

DATA : Used to enter data (numbers) in statistical calculations. (See page 57.)

2nd F CD : Used to correct an error in statistical data entry. (See page 62.)

3-VLE

+/− NEG

Change Sign/3-Variable Linear Equations Mode/Negative Key

+/− : Changes the sign of the number displayed from a positive to a negative or vice versa.
Example: 5 +/− → −5

2nd F 3-VLE : Used to set a special mode for calculating simultaneous linear equations with three unknowns x, y, and z (called 3-VLE mode for short). (See page 69.)

AD Download to read ad-free.

NEG : Used to obtain the negative counterpart of a number in BIN, OCT, and HEX modes. (See page 50.)

CPLX

•

Decimal Point/Complex Number Mode Key

• : Used to place the decimal point in the number entered.
Example: 12.3 → 1 2 • 3
0.7 → • 7

2nd F CPLX : Used to set the complex number calculation (CPLX) mode. (See page 43.)

%

= ENT

Equals/Percent/Enter Key

= : Used to obtain the result of a calculation.

2nd F % : Used for percent calculations and add-on/discount calculations. (See page 36.)

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

ENT : Used to enter the coefficients of simultaneous linear equations with three unknowns and to obtain the value of the determinant in 3-VLE mode. (See page 70.)

nPr
nCr

Combinations/Permutations Key

nCr : Used to determine the number of possible combinations when selecting a specific number of items (r) from any number of different items (n).

2nd F nPr : Used to determine the number of possible permutations when arranging a specific number of items (r) selected from any number of different items (n).

AD Download to read ad-free.

DISPLAY

(1) Display format

(Floating decimal system, normal display)

(Scientific notation system)

Mantissa Exponent

AD Download to read ad-free.

(2) Signs and Indicators

The following signs and indicators appear in the display:

− :Minus sign
Indicates that the mantissa or exponent part of the number in the display following the " − " is a negative.

M1 :Memory sign
Indicates that a number other than 0 is stored in the 1st memory (M1).

M2 :Memory sign
Indicates that a number other than 0 is stored in the 2nd memory (M2).

E :Error sign
Indicates that an overflow or an error has occurred in the calculator.

2ndF :2nd function designation indicator

HYP

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

DEG :Degrees indicator
Indicates that "degrees" must be used as the angular unit for the calculation or that the converted result is displayed in degrees.

RAD :Radians indicator
Indicates that "radians" must be used as the angular unit for the calculation or that the converted result is displayed in radians.

GRAD :Grad indicator
Indicates that "grads" must be used as the angular unit for the calculation or that the converted result is displayed in grads.

FIX :FIX mode indicator
Indicates that the result of a calculation is to be displayed in the fixed decimal point system.

SCI :SCI mode indicator
Indicates that the result of a calculation is to be displayed in the scientific notation system.

ENG :ENG mode indicator
Indicates that the result of a calculation is to be displayed in the engineering notation system.

AD Download to read ad-free.

( ) :Parenthesis indicator
Appears when the open parenthesis [( ] key is pressed, indicating that a parenthesized calculation is being executed.

BIN :BIN mode indicator
Indicates that the calculator is in the BIN (binary number system) mode or that the displayed number is a binary number.

OCT :OCT mode indicator
Indicates that the calculator is in the OCT (octal number system) mode or that the displayed number is an octal number.

HEX :HEX mode indicator
Indicates that the calculator is in the HEX (hexadecimal number system) mode or that the displayed number is a hexadecimal number.

CPLX :CPLX mode indicator
Indicates that the calculator is in the complex number calculation (CPLX) mode.

STAT :STAT mode indicator
Indicates that the calculator is in the statistical calculation (STAT) mode.

AD Download to read ad-free.

3-VLE :3-VLE mode indicator
Indicates that the calculator is in the 3-value linear equations (3-VLE) mode.

x :x indicator
Indicates that solution x of the simultaneous linear equations is being displayed.

y :y indicator
Indicates that solution y of the simultaneous linear equations is being displayed.

z :z indicator
Indicates that solution z of the simultaneous linear equations is being dis-

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

BATTERY REPLACEMENT

If the indicators and numbers in the display (LCD) appear to be dim, it is a sign of low battery voltage, meaning the batteries are nearing the end of their life. Replace the batteries with new ones as quickly as possible according to the following procedure.

Batteries: Two alkaline manganese batteries (Type: LR-44) or two silver oxide batteries (Type: S15 or SR-44) are in use.
(Eveready model S76, Mallory model MS76 and Ray-O-Vac model RS76 or equivalent should be used.)

1. Turn off the power of the calculator.
2. Remove the two screws from the rear of the calculator with a Phillips screwdriver and detach the back cover. (See Fig. 1.)
3. Remove the two old batteries from the battery compartment and replace them with two new ones. (See Fig. 2.)
4. Hook the two side tabs of the back cover into the two side slits of the calculator unit. (See Fig. 3.)

AD Download to read ad-free.

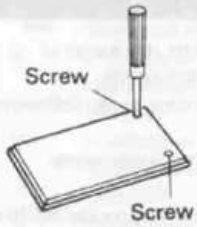


Fig. 1

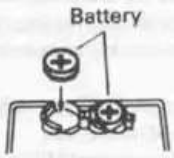


Fig. 2

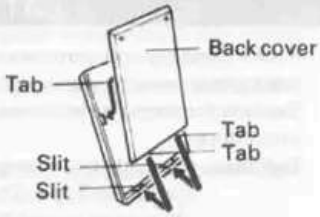


Fig. 3

5. Secure the back cover to the unit with the screws while gently holding down the back cover.
6. After the replacement, press the OFF and ON/C keys in this order to clear the calculator. When the batteries are correctly installed, "DEG 0." will be displayed. (If the display shows nothing or a meaningless symbol, or any of the keys becomes inoperative, remove the batteries and install them again. Press the OFF and ON/C keys in this order and check the display again.)

AD Download to read ad-free.

NOTE:
- Before inserting the new batteries, wipe them clean with a dry cloth. Then install the batteries with attention paid to the polarity (plus side up) as shown in Fig. 2.
- Always replace both the batteries at the same time.

Keep batte

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.

SPECIFICATIONS

Model:	EL-506A
Display capacity:	Floating decimal point display: 10 digits Exponent display: Mantissa—10 digits, Exponent—2 digits
Symbols:	Minus sign appears both in mantissa and exponent parts, etc. See "DISPLAY."
Calculations:	Four basic airthmetic calculations, constant calculations, memory calculations, degrees/minutes/seconds ⟷ decimal degrees conversion, trigonometric and inverse trigonometric functions, logarithmic functions, exponential functions, square and power, square root, cubic root, power root, reciprocals, factorial, coordinates conversion, statistical calculations, hyperbolic and inverse hyperbolic functions, percent calculations, complex number calculations, binary/octal/hexadecimal number calculations, logical operations, permutations, combinations, 3-variable linear equations, etc.
Component:	LSI, etc.

AD Download to read ad-free.

Display type:	Liquid crystal (FEM type)
Power supply:	3V ⎓ (DC): Alkaline manganese battery × 2 or silver oxide battery × 2
Operating time:	Alkaline manganese batteries (LR-44): Approx. 1,300 hours Silver oxide batteries (SR-44) Approx. 2,500 hours with display 5555. at 20°C (68°F) (The above data slightly changes depending on the type of the battery or its usage.)
Ambient temperature:	0° to 40°C (32° to 104°F)
Power consumption:	3V ⎓ (DC): 0.0002W
Dimensions:	69(W)×128(D)×7.5(H) mm 2−23/32" (W)×5−1/32" (D)× 9/32" (H)
Weight:	73g (0.16 lb.) (With batteries)
Accessories:	Wallet, alkaline manganese battery (LR-44)×2 (built-in), Operation Manual, and Application Book

AD Download to read ad-free.

SCIENTIFIC & CALCULATOR FUNCTIONS

Scientific Functions

Trigonometric	sin, cos, tan	3
Inverse Trig		
Exponential		
Power, Pow		

知乎 首发于 计算器爱好者之家

Coordinates Conversion	→rθ, →xy	2
Hyperbolic	sinh, cosh, tanh	3
Inverse Hyperbolic	$\sinh^{-1}$, $\cosh^{-1}$, $\tanh^{-1}$	3
Number System		
Conversion	→HEX, →OCT, →BIN, →DEC	12
Calculation	HEX, OCT, BIN, NEG	4
Logical Operations	NOT, AND, OR, XOR, XNOR	5

AD Download to read ad-free.

Scientific Functions (Contd)

Statistical		
Single-variable statistics	n, Σx, Σx^2, $\bar{x}$, σ, S	6
Data input and correction	CD, DATA	2
Probability (Normal distribution)	t, P(t), Q(t), R(t)	4
Modifying	MDF	1
Factorial	n!	1
Permutations, Combinations	nPr, nCr	2
Percent	%, +%, −%, ×%, ÷%	5
Complex Number	C PLX, (four basic operations, coordinates conversion)	6
Random Number	RND	1
Simultaneous Linear Equations	3-VLE	1
Constant	y^x, $\sqrt[x]{y}$	2
Parentheses (Open/Close),	(,), Pending Operations	3
Display	FIX, SCI, ENG, TAB	4
Data Entry	π, Exp	2
Total		93

AD Download to read ad-free.

Calculator Functions

Clear, Edition (four basic)	C, CE, →	3
Arithmetic	+, −, ×, ÷	4
Memory	X→M_1, X→M_2, M_1+, M_2+, RM_1, RM_2	6
Negative Number Entry	+/−	1
Constant calculation	+, −, ×, ÷	4
Exchange	↕	1
Total		19

112 Functions	
93	Scientific
19	Calculator

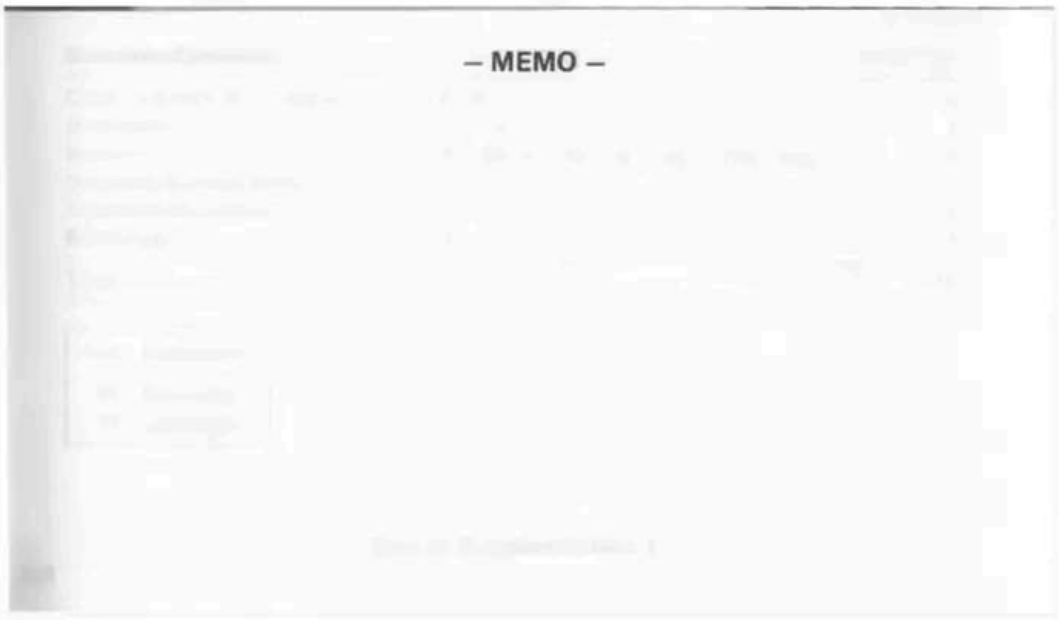
End of Supplementary 3

AD Download to read ad-free.

– MEMO –

知乎 首发于 计算器爱好者之家

AD Download to read ad-free.



AD Download to read ad-free.

AD Download to read ad-free.

发布于 2024-01-18 00:48 · IP 属地浙江

夏普 科学计算器 夏普计算器

写下你的评论...

5 条评论 默认 最新

Niji
大佬有没有546d的英文说明书，到处翻都没有找到
02-11 · IP 属地湖北 回复 喜欢

Niji ‣ **辽电VerA**
我有506D的英文说明书，功能应该跟这个差不多，只不过506D没有分数但是有数值积分功能
02-18 · IP 属地湖北 回复 喜欢

辽电VerA 作者
546D的话，如果你会用卡西欧fx991W，那基本功能可以靠键标记的缩写猜出来。我在用的时候就完全没看过说明书，全靠经验猜
02-18 · IP 属地浙江 回复 喜欢

展开其他 2 条回复 〉

文章被以下专栏收录

计算器爱好者之家
欢迎来到计算器爱好者之家，祝大家玩的愉快

推荐阅读